

WHAT IS CLAIMED IS:

- 1 1. A device for emitting output light, said device comprising:
2 a light source that emits first light of a first peak wavelength in a
3 blue wavelength range; and
4 a wavelength-shifting region optically coupled to said light source
5 to receive said first light, said wavelength-shifting region including Group IIB
6 element Selenide-based phosphor material having a property to convert some of
7 said first light to second light of a second peak wavelength in a red wavelength
8 range, said wavelength-shifting region further including Gallium Sulfide-based
9 phosphor material having a property to convert some of said first light to third
10 light of a third peak wavelength in a green wavelength range, said Gallium
11 Sulfide-based phosphor material including at least one Group IIA element selected
12 from a group consisting of Calcium, Strontium and Barium, said first light, said
13 second light and said third light being components of said output light.
- 1 2. The device of claim 1 wherein said Group IIB element Selenide-based
2 phosphor material of said wavelength-shifting region includes Zinc Selenide.
- 1 3. The device of claim 2 wherein said Group IIB element Selenide-based
2 phosphor material of said wavelength-shifting region includes said Zinc Selenide
3 activated by at least one element selected from a group consisting of Copper,
4 Chlorine, Fluorine, Bromine and Silver.
- 1 4. The device of claim 1 wherein said Group IIB element Selenide-based
2 phosphor material of said wavelength-shifting region includes Cadmium Selenide.
- 1 5. The device of claim 1 wherein said Gallium Sulfide-based phosphor
2 material includes Barium Gallium Sulfide activated by a rare metal element.
- 1 6. The device of claim 5 wherein said Gallium Sulfide-based phosphor
2 material includes said Barium Gallium Sulfide activated by Europium as defined
3 by the formula: $\text{BaGa}_4\text{S}_7\text{:Eu}$.

1 7. The device of claim 1 wherein said light source includes a light emitting
2 diode die.

1 8. A device for emitting output light, said device comprising:
2 a semiconductor die that emits first light of a first peak wavelength
3 in a blue wavelength range;
4 a phosphor-containing medium optically coupled to said light
5 source to receive said first light, said phosphor-containing medium including
6 Group IIB element Selenide-based phosphor material having a property to convert
7 some of said first light to second light of a second peak wavelength in a red
8 wavelength range, said phosphor-containing medium further including Gallium
9 Sulfide-based phosphor material having a property to convert some of said first
10 light to third light of a third peak wavelength in a green wavelength range, said
11 Gallium Sulfide-based phosphor material including at least one Group IIA
12 element selected from a group consisting of Calcium, Strontium and Barium, said
13 first light, said second light and said third light being components of said output
14 light.

1 9. The device of claim 8 wherein said Group IIB element Selenide-based
2 phosphor material of said phosphor-containing medium includes Zinc Selenide.

1 10. The device of claim 9 wherein said Group IIB element Selenide-based
2 phosphor material of said phosphor-containing medium includes said Zinc
3 Selenide activated by at least one element selected from a group consisting of
4 Copper, Chlorine, Fluorine, Bromine and Silver.

1 11. The device of claim 8 wherein said Group IIB element Selenide-based
2 phosphor material of said phosphor-containing medium includes Cadmium
3 Selenide.

1 12. The device of claim 8 wherein said Gallium Sulfide-based phosphor
2 material includes Barium Gallium Sulfide activated by a rare metal element.

1 13. The device of claim 12 wherein said Gallium Sulfide-based phosphor
2 material includes said Barium Gallium Sulfide activated by Europium as defined
3 by the formula: $\text{BaGa}_4\text{S}_7\text{:Eu..}$

1 14. The device of claim 8 wherein said semiconductor die is a light emitting
2 diode.

1 15. A method of emitting output light, said method comprising:
2 generating first light of a first peak wavelength in a blue
3 wavelength range;
4 receiving said first light, including converting some of said first
5 light to second light of a second peak wavelength in a red wavelength range using
6 Group IIB element Selenide-based phosphor material and converting some of said
7 first light to third light of a third peak wavelength in a green wavelength range
8 using Gallium Sulfide-based phosphor material, said Gallium Sulfide-based
9 phosphor material including at least one Group IIA element selected from a group
10 consisting of Calcium, Strontium and Barium; and
11 emitting said first light, said second light and said third light as
12 components of said output light.

1 16. The method of claim 15 wherein said Group IIB element Selenide-based
2 phosphor material includes Zinc Selenide.

1 17. The method of claim 16 wherein said Group IIB element Selenide-based
2 phosphor material includes said Zinc Selenide activated by at least one element
3 selected from a group consisting of Copper, Chlorine, Fluorine, Bromine and
4 Silver.

1 18. The method of claim 15 wherein said Group IIB element Selenide-based
2 phosphor material includes Cadmium Selenide.

1 19. The method of claim 15 wherein said Gallium Sulfide-based phosphor
2 material includes Barium Gallium Sulfide activated by a rare metal element.

- 1 20. The method of claim 19 wherein said Gallium Sulfide-based phosphor
- 2 material includes said Barium Gallium Sulfide activated by Europium as defined
- 3 by the formula: $\text{BaGa}_4\text{S}_7\text{:Eu..}$